point, but I think the statement I have just made for plant diseases as a whole is quite true. The late Marshall Ward came the nearest perhaps to being such a man, and yet to the writer Dr. Duggar's book shows a better grasp of the whole subject and is more interesting than either one of the books which Marshall Ward published. All criticisms of this sort would have been forestalled by the use of a slightly different title.

In conclusion the writer feels like recommending this book heartily and hopes that it may have so prompt and wide a circulation in this country that a new edition may be called for soon. Meanwhile for the digestion of the physiological critics, it may be suggested that it is a good deal easier to point out the defects in a good book than it is to write a better one. Undoubtedly the ideal plant pathology would be one in which a just balance is kept between the activities of the parasite on the one hand and the reactions of the host plant on the other, and when we know enough about these two subjects, then it will be very easy to write such a book, but the time is not yet. Meanwhile, let us take what we can get and be thankful, particularly when it is as good as the volume in question.

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ZOOLOGY OF THE INDIAN OCEAN

The Percy Sladen Trust Expedition to the Indian Ocean in 1905. Reports 22–33. (Trans. Linnean Soc. London, 2d Ser., Zoology. Vol. XIII., Pts. 1 and 2, October, 1909, February, 1910.)

The important collections brought back from the islands of the Indian Ocean by the expedition under the leadership of Mr. J. Stanley Gardiner continue to furnish material for reports by different specialists. Reports 22 to 33, now before us, are the following: Nemerteans, by R. C. Punnett and C. Forster Cooper; Echinoderma (exclusive of Holothurians), by F. Jeffrey Bell; Cirripedes, by A. Gruvel; Rhynchota, by W. L. Distant; Amphipoda Hyperiidea, by A. O. Walker; Land and Freshwater Mollusca, by E. R. Sykes; Marine Mollusca, by J. Cosmo Melvill; Alcyonarians, by J. Arthur Thomson, E. S. Russell and D. L. Mackinnon; Cephalochorda, by H. O. S. Gibson; Crustacea (Penæidea, Stenopidea and Reptantia), by L. A. Borradaile; Lepidoptera (exclusive of Tortricidæ and Tineidæ), by T. Bainbrigge Fletcher; Polychæta, part 2, by F. A. Potts. Perhaps the most interesting is that of Mr. H. O. S. Gibson, on the so-called genus *Amphioxides,* which appears to consist of larval forms of Branchiostomids. The expedition brought back abundant material, representing Goldschmidt's species *A. pelagicus* and *A. valdiviæ,* which are believed to belong to *Asymmetron* and *Heteropleuron,* respectively. Mr. Gibson gives a very elaborate discussion of their structure and affinities, but shows that more material and observations are needed to complete the chain of evidence.

The land fauna of the Seychelles is of great interest, owing to the position of the islands between Africa (and especially Madagascar) and India. There are rather numerous precinctive birds and reptiles, and one would expect the various groups of invertebrates, when thoroughly collected, to yield many remarkable species. Mr. Sykes gives us a list of the Mollusca, describing three as new. He remarks: "Very little can be at present stated as to the origin of the fauna: *Streptaxis* shows African influence, *Stylodonta* that of Madagascar, while *Cyathopoma* is mainly Indian. The connection with any mainland must have been at a very remote period, from the well-marked forms (*Acanthennea, Priodiscus,* etc.) now found." The list given is incomplete, from the omission of five species of *Veronicella.* Mr. Distant lists the Rhynchota or Hemiptera of the Seychelles, which so far include 51 Heteroptera and 12 Homoptera (not counting Coccidæ).[1] Of all these, it appears that five genera and 28 species are ostensibly precinctive, but as the Hemiptera of Madagascar are still very imperfectly known, no particular significance can attach to these

[1] This enumeration includes not only the Seychelles, but the Farquhar, Amirante and Coetivy groups.

figures. Unfortunately Mr. Distant, in describing the new genera and species, scarcely ever makes any comparisons with their allies. The same criticism may be made of many of Mr. Fletcher's descriptions of Seychelles Lepidoptera, and of numerous other recent publications of new species of insects. If the species or genera described have been ascertained to be new, they must have been compared with their relatives, and there seems to be no excuse for omitting information on this point, which would be of so much service to subsequent workers. Mr. Fletcher's long and elaborate account of the Lepidoptera brings out a number of interesting facts. For the Seychelles proper he enumerates 120 species, of which only 17 appear to be precinctive. Putting aside the widely-spread forms, the specially Indian element is very small; the African is distinctly greater. Among the butterflies, only a single species (*Parnara morella*) is peculiar to the Seychelles; two others are confined to Aldabra and the Seychelles. In a brief account of the Lepidoptera of the Chagos Archipelago 26 species are enumerated, three being precinctive. One butterfly (*Junonia vellida*) is Australian, and is supposed to have arrived by way of Christmas Island.

T. D. A. COCKERELL

THE GEOGRAPHY OF FERNS

THE venerable pteridologist, Christ, in the course of a long and exhaustive study has accumulated a wealth of fern information not directly usable in taxonomic publications, which he has lately brought together in a separate volume.[1] His treatment comprises separate analyses of environmental and geographic considerations.

Though of an ancient line of descent with a fairly large persistence of Tertiary or earlier types, and comprising a rather insignificant fraction (considerably less than 10,000 species) of the present vascular flora of the world, the ferns are found to follow the same distributional laws as the more modern and now dominant seed plants and to show similar endemic centers. Though on the one hand tolerant of extreme precipitation, and on the other presenting some of the most marked examples of xerophytic dormancy, they appear to have been in the main less pliable than the seed plants. Few grow where the annual rainfall is less than 25 inches and their lateral and vertical distribution in general agrees with that of forests, their greatest occurrence being coincident with that of the tropical forests under a rainfall of 80 inches or more per year; one only is aquatic, and only two or three are halophytes. In adaptive form they ring nearly all the changes from minute epiphytic or terrestrial herbs to lianas, climbers and trees; and slime protection, nectar secretion, myrmecophily, food and water storage and numerous and varied provisions against drought, parallel those of the spermatophytes. The chief areas differentiated by their floras are: the cool-temperate northern forest regions, the Mediterranean region, China-Japan, Malaya, Australia-New Zealand, tropical Africa, south Africa, the Mexican table-land, tropical America, the south Brazilian campos, the Andes, and the south-Chilean region.

Though sometimes separated from the explanatory text, the many original half-tone illustrations of form and habit add much to the attractiveness and usefulness of what must be regarded as at once an unusual and a valuable contribution to botanical literature—the richness of which in specific information is indicated by a three-column index of over fourteen pages, devoted to the forms mentioned in the text.

W. T.

An Outline of Individual Study. By G. E. PARTRIDGE, Ph.D. New York, Sturgis & Walton. 1910. Pp. v + 240.

This book is intended as a guide for those who wish to engage in the study of individuals. The author believes that it will be of value to superintendents and teachers and that such study might well supplement if not take the place of general psychology in normal schools.

[1] H. Christ, "Die Geographie der Farne," Jena, Verlag von Gustav Fischer, 1910, 8vo, pp. 357, figs. 130, maps 3. Price 12 Marks.